

Force Practice Problem 9.13.11 AP Physics

#29: A block is given an initial velocity of 5.00 m/s up a frictionless 20.0 degree incline. How far up the incline does the block slide before coming to rest?

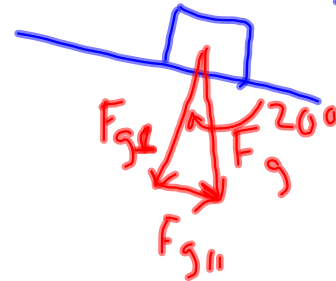
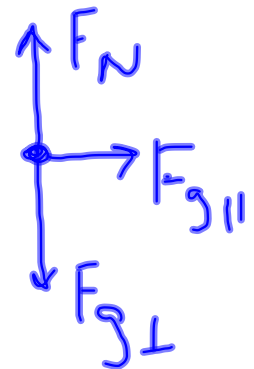


$$v_{fx} = v_{ix} + 2a_x \Delta x$$

$$\Delta x = \frac{-v_{ix}^2}{2a_x}$$

$$= \frac{-v_{ix}^2}{2a_g \sin(20^\circ)}$$

$$= -3.73 \text{ m}$$



$$F_{g||} = F_g \sin(20^\circ)$$

$$\Sigma F_x = ma_x$$

$$F_{g||} = ma_x$$

$$ma_g \sin(20^\circ) = ma_x$$

$$a_x = a_g \sin(20^\circ)$$

$$\Sigma F_y = 0 = ma_g \sin(20^\circ)$$

$$F_N - F_{g\perp} = 0$$

$$F_N = F_{g\perp}$$